with pressure below 29.70. During the 26th the storm apparently divided, one part passing to Manitoba and the other to South Dakota. The morning of the 27th a trough of low pressure extended from Lake Superior to Colorado with 2 cyclonic centers, one north of Lake Superior and the other over Nebraska. On this date thunderstorms occurred in Nebraska, heavy rains were noted in Wisconsin and Ohio, and high westerly winds prevailed over the Lake region. By the night of the 27th the cyclonic area over Nebraska had been forced southward by an area of high pressure from the northwest and it apparently disappeared by an increase of pressure over western Texas and New Mexico. The storm central north of Lake Superior advanced to the region northeast of Georgian Bay by the night of the 28th, attended by thunderstorms in New York and the Ohio Valley, and heavy rain at points in the upper lake region. The storm remained nearly stationary over the Saint Lawrence Valley during the 29th, with rain from the upper Mississippi valley over the middle Atlantic and New England states, and thunderstorms in New York state. By the morning of the 30th the center had disappeared over the Gulf of Saint Lawrence, rain continued in the middle Atlantic and New England states, and thunderstorms were reported in northern Virginia.

XI.—Appeared over Alberta the night of the 28th, with pressure 29.70, and during the 29th advanced eastward north of Montana, with pressure below 29.60, and rain and thunderstorms in the middle Rocky Mountain region. During the 30th the storm-center advanced eastward over Manitoba, without evidence of marked strength, and during the 31st passed to the region east of Lake Superior, with rain in the Atlantic coast states, and thunderstorms at points in the middle Atlantic coast states.

NORTH ATLANTIC STORMS FOR JULY, 1892 (pressure in inches and millimeters; wind-force by Beaufort scale).

The paths of storms that appeared over the west part of the north Atlantic Ocean during July, 1892, are shown on Chart I. These paths have been determined from reports of observations by shipmasters received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

In July there is usually an increase of pressure over the north Atlantic Ocean, except off the middle Atlantic and New England coasts and over eastern and extreme northern parts of the ocean. The increase of pressure is small, less than .05 inch, while from the British Isles northward the decrease is .05 to .10 inch.

The storms of July advance eastward over the north Atlantic at an average velocity of 19 statute miles per hour, and an average of 1.8 storm traverses the ocean from coast to coast. The principal track of July storms is traced from Newfoundland to a point west of Scotland, where it divides, one branch passing northeastward along the coast of Norway, one eastward over the North and Baltic seas, and one southeastward over Great Britain and France.

The storms of the current month were of small intensity, and no storms of tropical origin appeared within the region of observation. Four of the storms traced apparently advanced from the American to the European coasts. On the 3d a cyclonic depression moved eastward from the Labrador coast and reached mid-ocean on the 4th, with central pressure about 29.40 (747), and westerly gales of force 7 to 10. By the 5th this storm had advanced north of the British Isles, with pressure about 29.50 (749). During the 4th a storm of marked strength, low area I, moved east-northeast over the Gulf of Saint Lawrence, with pressure below 29.50 (749), and on the 5th was central north of the Banks of Newfoundland, with west to north gales of force 9 in the trans-Atlantic tracks between the 40th and 50th meridians. Moving north of east this storm passed north of the British Isles during the 8th, its passage being attended by strong northwest gales between the 20th and 30th meridians on the 6th.

On the 8th a storm apparently moved eastward from Labrador and reached mid-ocean on the 9th, with pressure about 29.50 (749), and westerly gales of force 9 to 10 between the 30th and 40th meridians. During the next 24 hours this storm increased in energy, and pressure below 29.40 (747) and northwest gales of force 10 were noted between the 20th and 30th meridians. During the 11th and 12th the storm-center remained nearly stationary west of Ireland, with northwest gales of force 9 to 10 east of the 20th meridian. By the 13th the center of disturbance had passed southeastward to the Bay of Biscay, and by the 14th had moved eastward over the continent of Europe.

On the 12th a storm appeared central north of the Banks of Newfoundland, and passed thence to mid-ocean, where pressure falling to about 29.70 and fresh gales were reported for the 13th and 14th. By the 16th the center of disturbance had advanced south of Ireland, after which it disappeared to the eastward. During the 14th low area IV moved eastward over northern Newfoundland and occupied the region north of the Grand Banks on the 15th, after which the center apparently recurved westward and united with low area V. Low area V crossed the Gulf of Saint Lawrence and northern Newfoundland on the 17th, and passed thence rapidly northeastward beyond the region of observation. Low area VII moved eastward north of the Saint Lawrence River during the 22d, and the morning of the 23d was central over or near Labrador. This storm apparently remained stationary north of Newfoundland and the Grand Banks until the 27th, when it was joined by low area IX. During the next three days the pressure continued low over the western part of the ocean, with fresh south to west gales west of the 40th meridian. The month closed with high pressure and generally fine weather from coast to coast.

OCEAN ICE IN JULY.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for July during the last 10 years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
	° ′	° ′		° ′	° ′
July, 1883	42 42	49 57	July, 1883	46 47	45 44
July, 1884	46 24	50 02	July, 1884	48 36	46 28
July, 1885	42 14	48 30	July, 1885	48 00	44 00
July, 1886	42 59	49 18	July, 1886*	45 52	34 30
July, 1887	43 30	50 05	July, 1887	52 04	41 16
July, 1888	46 30	54 00	July, 1888	47 40	50 10
July, 1889	44 49	47 45	July, 1889	45 50	40 00
July, 1890	41 25	47 30	July, 1890†	50 08	38 45
July, 1891	43 16	49 45	July, 1891	47 02	48 00
July, 1892	43 04	50 17	July, 1892	48 00	44 40
Mean	43 44	49 25	Mean	48 00	44 00

*An iceberg and field ice. †On the 10th a small piece of ice was reported in N. 48° 33′, W. 24° 11′.

The limits of the region within which icebergs or field ice were reported for July, 1892, are shown on Chart I by ruled shading.

The southernmost ice reported, an iceberg observed on the 28th in the position given, was about 1° south of the average southern limit, and the easternmost ice reported, a large iceberg noted on the 20th in the position given in the table, was nearly 1° west of the average eastern limit of Arctic ice for July. The ice of the current month was noted most frequently in and east of the Straits of Belle Isle and off the southeast coast of Newfoundland.

OCEAN FOG IN JULY.

The limits of fog belts west of the 45th meridian, as reported by shipmasters, are shown on Chart I by dotted shading.

More than the usual amount of fog was reported. Near the Banks of Newfoundland fog was reported on 26 dates; between the 55th and 65th meridians on 18 dates; and west of the 65th meridian on 17 dates. Compared with the corresponding month of the last 4 years the dates of occurrence of fog east of the 55th meridian numbered 3 greater than the average; between the 55th and 65th meridians 4 greater than the average; and west of the 65th meridian 8 greater than the average. The fog noted by shipmasters and that reported by observers of the Weather Bureau on the New England and middle Atlantic coasts generally attended the advance or passage of general storms.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for July, 1892, is exhibited on Chart II by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the average for the several districts. The normal for any district may be found by adding the departure to the current mean when the temperature is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Weather Bureau represents the mean of the maximum and minimum temperatures.

The mean temperature was highest in the Gila and lower Colorado valleys, where it was above 95, and the mean readings were above 85 in adjoining parts of Arizona and southern California, and in the lower Rio Grande valley. Over the Florida Peninsula, along the South Carolina, Georgia, and Gulf coasts, in Louisiana, Texas, and Indian and Oklahoma territories, over the southwestern plateau region, and in southeastern California the mean values were above 80. The mean temperature was lowest along the immediate Pacific coast north of San Francisco, Cal., where it was below 55, and it was below 60 in Calgary, in the mountains of central Colorado, in the lower Saint Lawrence valley, and at Yarmouth, N. S.

DEVIATIONS FROM NORMAL TEMPERATURE.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for July for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for July, 1892; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for July during the period of observation and the years of occurrence:

State and station.	(1) Normal for the month of July.	(2) Length of record.	(3) Mean for July, 1892.	(4) Departure from normal.	(5) Extreme monthly mean for July.			
					Highest.	Year.	Lowest.	Year.
Arizona.	°	*Years*	°	°	°		°	
Fort Apache	75.7	20	74.8	− 0.9	83.6	1877	70.3	1883
Fort Mohave	95.5	21	93.1	− 2.4	100.1	1873	90.1	1888
Whipple Barracks	75.3	21	73.9	− 1.4	81.7	1878	70.4	1883, 1891
Arkansas.								
Lead Hill	81.3	10	.....	.....	84.2	1888	75.2	1882
California.								
Fort Bidwell	71.6	21	66.9	− 4.7	75.9	1874	63.9	1884
Riverside	77.3	10	.....	.....	79.4	1883	75.9	1889
Colorado.								
Las Animas	75.7	9	76.0	+ 0.3	79.1	1890	73.0	1891
Florida.								
Merritts Island	80.7	10	81.3	+ 0.6	82.8	1891	78.5	1886
Georgia.								
Forsyth	81.9	18	79.2	− 2.7	85.7	1881	78.3	1882
Idaho.								
Boise Barracks	74.0	18	70.3	− 3.7	79.6	1873	69.4	1884
Fort Sherman	67.3	8	65.3	− 2.0	74.2	1889	62.6	1884
Illinois.								
Centralia	79.0	11	.....	.....	88.0	1887	73.0	1882
Indiana.								
Lafayette	73.4	10	73.9	+ 0.5	79.8	1887	69.0	1882
Indian Territory.								
Fort Supply	80.6	13	79.6	− 1.0	85.8	1874	76.4	1891
Iowa.								
Cresco	70.9	19	69.6	− 1.3	75.2	1874	65.1	1891

Deviations from normal temperature—Continued.

State and station.	(1) Normal for the month of July.	(2) Length of record.	(3) Mean for July, 1892.	(4) Departure from normal.	(5) Extreme monthly mean for July.			
					Highest.	Year.	Lowest.	Year.
Kansas.	°	*Years*	°	°	°		°	
Eureka Ranch	81.4	9	76.6	− 4.8	86.2	1890	76.3	1891
Independence	79.5	20	79.7	+ 0.2	85.9	1879	74.7	1891
Salina	81.3	9	79.0	− 2.3	86.3	1890	76.2	1891
Louisiana.								
Grand Coteau	82.5	7	79.0	− 3.5	85.4	1884	79.0	1892
Maine.								
Orono	66.9	22	68.6	+ 1.7	71.0	1887	64.2	1884
Maryland.								
Cumberland	72.1	21	72.9	+ 0.8	77.7	1889	70.3	1888
Michigan.								
Kalamazoo	72.2	15	72.6	+ 0.4	77.8	1885	67.2	1891
Missouri.								
Sedalia	78.6	12	76.5	− 2.1	82.8	1888	71.2	1891
Montana.								
Fort Custer	70.7	11	.....	.....	74.2	1890	67.8	1884
Nebraska.								
Fort Robinson	72.8	9	71.7	− 1.1	78.1	1886	66.9	1891
Genoa (near)	74.7	16	74.0	− 0.7	78.6	1890	69.8	1891
Nevada.								
Browns	83.5	20	84.1	+ 0.6	89.1	1873	79.4	1881
Carson City	71.5	14	68.9	− 2.6	73.7	1875	68.9	1892
New Hampshire.								
Hanover	69.3	20	67.4	− 1.9	72.1	1878	66.7	1884
New Mexico.								
Deming	86.1	10	90.6	+ 4.5	90.6	1892	80.7	1890
Fort Wingate	73.3	21	70.4	− 2.9	77.8	1873	68.1	1888
New York.								
Cooperstown	68.3	21	66.6	− 1.7	73.0	1887	64.5	1884
Plattsburg Barracks	69.6	20	68.8	− 0.8	73.2	1887	65.2	1891
North Carolina.								
Lenoir	74.5	19	72.9	− 1.6	77.7	1877	66.4	1884
Oklahoma.								
Fort Reno	80.8	9	79.8	− 1.0	84.9	1887	76.2	1891
Fort Sill	82.3	21	80.0	− 2.3	86.0	1871	77.2	1880
Oregon.								
Bandon	57.7	8	57.0	− 0.7	59.5	1888	54.6	1887
Eola	64.6	21	60.7	− 3.9	70.3	1889	59.6	1888
Pennsylvania.								
Dyberry	67.9	19	66.6	− 1.3	72.6	1887	63.0	1891
Grampian Hills	70.5	21	70.3	− 0.2	76.8	1887	65.4	1891
Wellsboro	69.4	13	64.5	− 4.9	76.1	1881	60.4	1891
South Carolina.								
Statesburg	78.3	11	76.4	− 1.9	84.0	1881	74.6	1891
South Dakota.								
Fort Sully	74.8	21	75.4	+ 0.6	80.2	1871	70.9	1884
Texas.								
Austin	84.0	19	84.5	+ 0.5	88.3	1879, 1884	82.0	1877
Silver Falls	80.1	6	81.6	+ 1.5	83.9	1888	74.6	1887
Utah.								
Terrace	82.0	17	83.5	+ 1.5	89.3	1874	77.6	1875
Vermont.								
Strafford	69.2	19	68.4	− 0.8	73.5	1887	65.7	1891
Virginia.								
Dale Enterprise	75.8	12	75.3	− 0.5	83.0	1887	71.5	1884
Washington.								
Fort Townsend	61.6	18	58.4	− 3.2	66.1	1875	58.4	1892
West Virginia.								
Parkersburg	78.1	11	72.2	− 5.9	87.0	1881	68.9	1886
Wisconsin.								
Embarrass	71.0	21	70.4	− 0.6	74.7	1874	65.5	1891
Madison	71.8	17	71.6	− 0.2	75.2	1885	66.6	1891
Wyoming.								
Fort Washakie	69.6	7	67.7	− 1.9	73.7	1886	65.4	1891

DEPARTURES FROM NORMAL TEMPERATURE.

The mean temperature was below the normal, except along the northern border of the country east of the 110th meridian, in New England, eastern New York, and eastern Pennsylvania, and over east parts of the middle and southern plateau regions. The most marked departure below the normal temperature was noted in North Carolina, South Carolina, at Vicksburg, Miss., and in the valley of the Columbia River, where it was more than 3, and the mean temperature was 2 to 3 lower than usual generally east of the Mississippi and south of the Ohio rivers, in Washington and Oregon, and along the